Niantic River Swing Bridge
Spanning the Niantic River on Connecticut
Route 156
East Lyme (and Waterford)
New London Gounty
Connecticut

HAER No. CT-22



PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
MID-ATLANTIC REGION, NATIONAL PARK SERVICE
DEPARTMENT OF THE INTERIOR
PHILADELPHIA, PENNSYLVANIA 19106

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HISTORIC AMERICAN ENGINEERING RECORD

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| Location: | Spanning the Niantic River on Connecticut Route 156 between the Towns of East Lyme and Waterford New London County, Connecticut<br><br>UTM: 18.736300.4578400<br>Quad: Niantic |
| Date of Construction: | 1921 |
| Builder/Designer: | Berlin Construction Company of Berlin, Connecticut; designer, George B. Taylor |
| Present Owner: | State of Connecticut<br>Department of Transportation<br>24 Wolcott Hill Road<br>Wethersfield, Connecticut 06109 |
| Present Use: | Vehicular and pedestrian bridge. Horizontal swing accommodates navigation on the river. |
| Significance: | The Niantic River Bridge has two spans: a fixed Pratt through truss and the swing span which resembles a Warren through truss with verticals. All members and all connections are riveted. |
| Project Information: | The Niantic River Swing Bridge is to be replaced by the Connecticut Department of Transportation funds provided by the Federal Highway Administration. Under Section 106 of the National Historic Preservation Act of 1966, mitigative documentation was prepared in 1986 by Mathew Roth and edited by Maribeth McCarthy Demma. |
| Transmitted by: | Jean P. Yearby, HAER, 1987 |

History of the Crossing

The crossing at the mouth of the Niantic River has been part of the shoreline transportation network since the first decades of colonization in Connecticut. Located between the early settlements of Saybrook and New London, the Niantic River presented an obstacle to overland communication between the two towns. Ferry service at Niantic River began in the 1650s. In 1660, the General Court of the colony granted the privilege of "keeping the ferry" to John Winthrop, Jr., who had earlier been granted some 650 acres east of the river for a farm.[1] This ferry was probably steered and conveyed by the ferrymen pulling on a rope strung between the banks; the still-current name of Rope Ferry Road, at the river's mouth, was derived from this practice. In all likelihood, the western ferry landing was at the end of the long sandbar that projects into the mouth of the river, leaving just 90 feet of water to be crossed. Both traffic and profit were apparently rather slight and regular service was never established by Winthrop or by Major Palmes, who purchased the ferry privilege from Winthrop's heirs. In 1720, the town of New London established a regular ferry at Niantic, as part of the completion of the shore road to Lyme. Peter Buor, who purchased the former Winthrop farm in 1723, sued successfully to regain the ferry privilege. Thereafter, the privilege was sold and divided many times, with no proprietor gaining substantial benefit from operating the ferry.

A new era for the crossing began in 1976, when the private firm of Niantic Bridge Company was incorporated to build and operate a toll bridge across the river. Little is known of the bridge except that it had a draw of some type and was somewhat controversial. During incorporation procedures for East Lyme in 1839, residents of Waterford (land for which had been taken from New London in 1801) objected to the formation of the new town because it was to include the portion of Waterford west of the Niantic River. Waterford acceded when East Lyme agreed to assume responsibility for overseeing the bridge company, which had become an annoyance. The residents of Waterford "regarded the bridge as unsafe, and the draw vexations, and the whole concern a nuisance, destroying the navigation and impeding the fisheries."[2] Several times Waterford had petitioned the State General Assembly to withdraw the bridge company's charter, but to no avail.

These problems had only begun with construction of the bridge. Even though the fisheries of Niantic River and bay had been exploited by the earliest colonists, ferry service had posed no impediment to navigation, as did the bridge. The fishing interests almost certainly were responsible for the inclusion of draw-capacity in the bridge, as this feature was necessary to allow vessels to pass upriver to fishing grounds. In the first half of the 19th century, other forms of commerce came to the area, while the fisheries, notably bass, blackfish and shellfish, also remained important components of the local economy. Granite quarrying at Millstone Point expanded greatly in the early 1830s. The quarries were downstream from the bridge, but the 30 to 40 boats that transported the stone were berthed in the river, upstream from

the bridge, so the schedule of bridge openings affected the flow of quarry work. Starting in the mid-1840s, the small coves in the river were used for commercial ice harvesting. Most of the ice was sold to oceanbound fishermen for packing their catch. Passage of these fishing boats was an added pressure on the operation of the bridge. Later in the 19th century, tourists began coming to Niantic for seaside vacations. Hotels were built along the bay and pleasure boats joined the water-borne traffic that had to be coordinated with surface transport at the movable bridge. (It is not know how many times the bridge was rebuilt, but almost certainly the original structure of 1796 did not continue in service throughout the 19th century.

The State Highway Commission assumed oversight of the crossing in 1985, when the program of state aid for town roads began.[3] The commission exercised no day-to-day supervision of operations, but when the U. S. War Department ordered in 1917 that a new bridge be constructed, it fell to the State to comply.[4] The apparent reason for the War Department's order was to improve surface transport for the coastal defense system. The Highway Commission could not comply with the order because, ironically, the War Industries Board had restricted output of structural steel so that the metal could be used for military material.[5] In further irony, in 1919, the Highway Commission let design and construction contracts for the bridge, after the wartime limitations on steel were lifted, yet also after the ostensible purpose for the War Department's order - wartime defense - had passed.[6] The bridge standing today is the one built under this postponed directive from the Federal Covernment. It opened to traffic in 1921.[7]

## The Present Structure

The Berlin Construction Company of Kensington, Connecticut, won the contract to build the bridge. This firm was founded in 1901 by the former managers of the Berlin Iron Bridge Company, which had been purchased by the American Bridge Company in 1900. George B. Taylor of Berlin Construction designed the bridge. The earlier bridge had crossed at the former ferry site, with its west abutment on the extended sand bar, but the Highway Commission selected a site several hundred feet upstream for the new bridge. The new crossing was more than twice as long as the old. It was probably selected in order to separate the highway bridge from the railroad bridge which had been built at the sand bar in 1907 (and continues to stand). This separation created a basin between the bridges in which boats that had passed one bridge could wait for the other to open.

The Berlin Construction Company fabricated and erected the superstructure and subcontracted substructure construction (contractor unknown). Manufacture of the drive equipment for the swing span was subcontracted to Earle Gear and Machine Company of Philadelphia.

The substructure consists of two abutments, the pivot pier at the center of the swing span, and a rest pier supporting the east end of the fixed span and the west end of the swing span. All of these elements are reinforced concrete supported on timber piles. Piers are faced with stone block and are protected by timber fenders on each side of the 65-foot wide channel created by opening the swing span. The underside of the two-lane bridge is about 10 feet above mean high water.[8]

The 180-foot long swing span is a Warren through truss with verticals. All members are steel and all connections are riveted. In each web there are 12 panels, each 15.0 feet long.[9] Members are built up of channels or angles with lacing, batten plates or cover plates. The operator's house is suspended above the roadway; originally, it was hung from the south side of the span.[10] Diagonal truss members in the center of the span are larger than the rest of the diagonals (two 15" channels with lacing on both sides as opposed to two
5" x 3-1/2" angles with lacing on one side). This feature was designed to support the extra weight of the operator's house and perhaps to stiffen the truss in the center during elevated loads when the bridge is open. For the same reasons, the center vertical is larger than the other verticals (two 10" channels with lacing on both sides as opposed to four 5" x 3-1/1" angles with a single play of lacing). Except for the floor system and the supports added when the operator's house was moved, all members are original to the bridge, although numerous alterations and repairs have been made. Many of the lacing bars within members have been replaced,[11] and patch plates have been welded across the gusset plates at the connections between truss verticals and the bottom chord.

The 94-foot long fixed span is a Pratt through truss, also of steel with riveted connections. Each of the six panels is 15.7 feet long. Like the swing span, all members are built up of channels or angles with lacing, batten plates or cover plates. Except for the floor system and for repairs similar to those on the swing span, the fixed span retains its original members.

The floor system underwent major renovation in 1941.[12] The only original parts remaining are the floor beams and stringers. Floor beams were built up from 30-inch wide plates with paired angles riveted at top and bottom to form flanges. Stringers consist of 9-inch deep I beams. Originally, there were wood beams ("spikers") bolted along the stringers; a diagonally-planked subfloor was nailed to the spikers and the plank deck was nailed to the subfloor. All the wooden pieces were removed in 1941, then 5-inch deep I beams were welded along the tops of the stringers and the present deck, steel grating, was attached to these I beams. The curbs, 10-inch deep steel channels, were also installed at this time.

Machinery for operating the bridge is located at the pivot pier. Structural elements of the swing system include a central pintle girder (the point of rotation) and cross girders and reaction girders that transmit the load of the span to the pivot pier when the bridge is open; these steel members are built

up from plates, channels and angles. An electric motor drives the span through a train of simple spur gears. Movement of the span is accomplished by driven spur gears traveling along a segmental rack gear fixed to the pivot pier. While in motion, the span is prevented from rocking by steel rollers at the pivot pier, and for part of the travel by similar rollers at the ends of the span. Mechanical and structural components all appear to be original to the structure. Electrical apparatus was changed in 1942, 1948, and 1951, when the entire electrical system was overhauled. New traffic signals, safety gates and wiring were installed at these times.[13]

The role of the crossing in the community of Niantic continues to reflect the sometimes conflicting interests of surface and water-borne transportation. Shell fisheries and tourism are now the major maritime industries in Niantic. Tourism also accounts for an increase in road traffic during the summer. During the rest of the year, the bridge carries mostly local traffic and workers commuting to the New London area from the west. The Millstone nuclear generation station occupies the former quarry lands, and workers from this facility have petitioned the State Department of Transportation to alter the crossing to ease their commuting.[14]

## FOOTNOTES

1 Frances M. Caulkins, "History of New London, Connecticut," New London, 1895, pp. 94, 121-2, 165-6, 171-2, 264, 402, 610, 614 and 617. The quoted words are from p. 94.

2 Caulkins, p. 614.

3 State of Connecticut, Biennial Report of the Highway Commissioner, 1903-1904, p. 5.

4 State of Connecticut, Annual Report of the Highway Commissioner, 1917, pp. 19-20. Hereafter referred to as Report.

5 Report, 1917, pp. 19-20; Report, 1918, p. 21.

6 Report, 1919, p. 24.

7 Report, 1921, p. 23.

8 Hardesty and Hanover, Consulting Engineers, "Report on the Inspection and Analysis of the Route 156 Bridge over the Niantic River...," Project No. 128-92, 1969, p. 2. Files of Department of Transportation Engineering Division, Newington, courtesy Robert Green.

9 All dimensions for the superstructure were obtained by M. Roth and V. Darnell in field examination on December 10, 1980. All field measurements were corrobated both in the Hardesty and Hanover report and in the original construction drawings on file at the Department of Transportation in Wethersfield, Connecticut.

10 Berlin Steel Construction Co., 75th Anniversary Catalog, 1971; c. 1921 photograph on p. 5.

11 Interview with Robert F. Victor, Bridge Safety and Inspection Section, Department of Transportation, December 8, 1980.

12 Hardesty and Hanover, p. 3.

13 Connecticut State Highway Department drawings, "Proposed Installation of Traffic Signals at Niantic River Bridge," 1942; "Conduit and Cable Design of Niantic River Bridge," 1948; "Redesign of Electrical Control System at Niantic River Bridge," 1951.

14 Victor interview; correspondence files relating to bridge operation, Bridge Safety and Inspection Section, Department of Transportation, Newington.